of infants of Weill are other manifestations of anaphylactic diarrhœa. They appear to be rare in this country.

4. *Endocrine diarrhœa.*—In Graves' disease and in the late stages of Addison's disease, an intractable, watery diarrhœa often occurs. This diarrhœa is relieved by an enema containing twenty to thirty minims of liq. adrenalini hydrochlor (1 in 1,000) to two pints of water. As adrenalin is not absorbed from the intestine, the enema may be repeated as often as desired during the day; but one enema a day is usually sufficient to control this troublesome symptom.

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A Review of 122 Consecutive Hysterectomies

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Two writers, Davis and Cusick,[1] in reviewing the subject of hysterectomy, start their paper with the following paragraph, which is worthy of repetition:

"The scientific attitude in hospital work would be measurably improved if there were an obligatory requirement for a yearly, five-yearly, and ten-yearly group-study of at least five per cent. of the major standardized operations. Improved studies of cases would be a natural result, a more efficient system of record-making would follow, availability of the records would be improved, and a worth-while follow-up system would be supported. . . . The follow-up problem involves expense and painstaking effort which has no immediate tangible value in hospital financing. Its value must be credited to the patient and doctor."

This paper is a review of 122 consecutive hysterectomies operated upon by myself in the Ulster Hospital, Royal Victoria Hospital, and in private, excluding Wertheims hysterectomies and those done for obstetrical emergencies. It also includes a follow-up of 110 of these cases, the other cases having been operated upon too recently to be of value from this point of view.

TABLE I—INDICATIONS FOR OPERATION.

Fibroid tumours	69
Fibroid and endometrioma	9
Fibroid and ovarian tumours	4
Fibroid and sarcomatous cervical polypus	1
Cancer of the uterine body	13
Fibrosis uteri	13
Tumours of the ovary	2
Endometrioma	4
Sarcoma of the uterus	1
Inflammatory pelvic disease	4
Suspicious cervix (microscopic)	1
Developmental abnormality	1
	122

Fibroid tumours, either alone or complicated by other tumours, were the indication in sixty-nine per cent. of the cases. Malignant tumours formed 11.4 per cent. of the cases. Endometrioma alone or complicated by fibroids occurred in 10.6 per cent.

TABLE II—MAIN SYMPTOM.

Abnormal bleeding	67.9%
Pain or discomfort	12.9%
Tumour	9.2%
Digestive symptoms	4.6%
Bleeding and pain	3.7%
Urinary symptoms	2.7%
Leucorrhœa	0.9%

This table simply proves what has been mentioned times without number, that any menstrual irregularity, especially in women over thirty, has usually a pathological basis which should be sought for and dealt with before treating the patient with ovarian extracts or ergot.

Abnormal bleeding was the main symptom of fibroids in a large percentage of cases, but some American authors do not agree that this is always so. Davis and Cusick,[1] for example, say that abdominal and pelvic pain, while not recognized as a symptom of fibromyomata by most textbooks, occurred much more frequently in their series than any other symptom. The frequency of this symptom in their series was sixty-five per cent.

In my series of cases, whether pain or bleeding was the main symptom, depended on the situation of the tumour. In those cases where pain was the main symptom, the tumour was either subserous, pedunculated, or had undergone degeneration. Where the tumour was encroaching on the endometrium, hæmorrhage was always the main symptom.

TABLE III—TYPE OF OPERATION.

	Number of Cases	*Percentage of Total*
Total hysterectomy	76	62.3%
Subtotal hysterectomy	46	37.7%

In cases requiring hysterectomy, I think the total operation is the better from every point of view, and where at all possible I should always prefer to do it. The above table includes many of my earlier cases, and the fact that thirty-seven per cent. of the operations done are of the subtotal type illustrates my early inexperience. Read and Bell,[2] in a recent paper on this subject, give inexperience in gynæcological surgery as one of the indications for the subtotal operation.

As one gains experience and judgment, the percentage of subtotal operations is bound to fall; for example, of the operations done in this series during the past year, over ninety per cent. have been of the total variety.

There are cases where the subtotal operation is unquestionably safer than the total, e.g., in cases with extensive involvement of the pelvis by endometriomatous tumours, where the rectum is densely adherent to the lower part of the uterus and cervix, in stout nulliparous patients, and in some benign cases, where the poor general condition of the patient indicates the shorter and easier operation.

In this series there has not been a case of cancer developing in the cervical stump following the subtotal operation, but it is too early to say that this disastrous complication may not occur. Since commencing this paper I have seen three such cases operated upon by other gynæcologists.

Spencer,[3] in commenting on this fact, states: "The truth is that the advocates of the subtotal operation cannot state the number of cases in which carcinoma occurs in the stump without an inquiry into the after-history of every one of their cases for a period of at least thirty years subsequent to the operation."

Fullerton and Faulkner,[4] in referring to the possibility of cancer developing in the cervical stump after subtotal hysterectomy, say that many of these cases occur very soon after the operation, suggesting the presence of cancer in the cervix at the time of operation.

Read and Bell,[2] in a recent paper discussing the sequelæ of the two operations, say, "Not only is subtotal hysterectomy more liable to remote complications, but also that the mortality-rate of the operation would be considerably raised if the deaths due to subsequent malignant disease of the cervix were included." The importance of this can be realized by figures from radiation centres for cases of cancer of the cervical stump attending for treatment. It has been found that from three to eight per cent. of the cases of cervical cancer attending for treatment have arisen in cervical stumps.

Reading American literature on the subject of hysterectomy, one is impressed with the fear that many authors have of doing the total operation, whereas in this country the total operation is strongly favoured.

The decision to do a subtotal hysterectomy should not be taken without being satisfied beyond a doubt about the condition of the cervix at the time of the

operation, or without doing a preliminary curettage to exclude the possibility of an unsuspected carcinoma of the body of the uterus.

MORTALITY.

There were two deaths in 122 cases, or 1.6 per cent. One case died from a pulmonary embolus following a subtotal hysterectomy for fibroids and an extensive endometrioma. This patient was difficult to anæsthetize, was cyanosed throughout the operation, and died a week later very suddenly. The second case died from shock. This patient was fifty-eight years of age, with a large ovarian cyst adherent to bowel, uterus, and bladder, probably due to an acute pelvic peritonitis. The appendix was also acutely inflamed. A subtotal hysterectomy, necessary on account of the fixity of the tumour to the uterus, was a very small part of the operation, and was not in itself responsible for the patient's death.

There were no deaths among seventy-six total hysterectomies. Mortality figures of other writers vary very much. Davis and Cusick,[1] in a series of 335 cases done by thirty-five different operators, show a mortality-rate of 4.5 per cent.

Burch and Burch,[5] reviewing two hundred cases, give a rate of 4.5 per cent. Spence,[3] in his series, which were all total hysterectomies, had a death-rate of 1.8 per cent., and in his paper quotes Lockyer as having a mortality of 1.45 per cent. Worrall,[6] in a series of 532 cases operated upon over a period of eighteen years, has a mortality-rate of 0.563 per cent. This is the best series so far published.

TABLE IV—MORTALITY.

Davis and Cusick - - - -	4.68%
Burch and Burch - - - -	4.50%
Spencer - - - - -	1.80%
Lockyer - - - - -	1.45%
Worrall - - - - -	0.56%
Macafee - - - - -	1.60%

Pulmonary embolism is still a dreaded complication of hysterectomy, and it seems to be more liable to occur after the subtotal than after the total operation.

Read and Bell,[2] investigating 2,344 cases operated upon in the Chelsea Hospital, found that this complication caused thirty-three per cent. of the deaths following the subtotal operation, while in the case of total hysterectomy it caused death in only ten per cent. of the fatal cases.

In my experience, the type of case likely to have post-operative complications, especially pulmonary embolus, is the patient who has a uterus containing several fibroids and fixed to the other pelvic organs by endometriomatous or inflammatory adhesions. The impaired mobility which results from these adhesions adds greatly to the operative difficulty, is liable to cause increased shock, and adds to the risk of injury to bowel and ureter.

In cases of endometrioma, there is the added risk of ileus as a result of extravasation of the retained menstrual fluid, which is very irritating to the peritoneum.

One of the most important things in preventing post-operative complications is

good anæsthesia, because the patient who is straining and cyanosed throughout the operation is the patient who is likely to develop a pulmonary embolus. Skilful anæsthesia has been a large factor in securing the smooth and rapid convalescence of the great majority of the patients in this series, and I am indebted to all the anæsthetists concerned.

COMPLICATIONS.

There were relatively few complications during the three weeks following the operation. Seven cases (including the two cases that died) showed departures from the usual type of convalescence, i.e., 5.7 per cent.

TABLE V—COMPLICATIONS.

	Total	*Subtotal*
Acute gastric dilatation	1	—
Secondary hæmorrhage from vaginal vault	1	—
Abscess in vaginal vault	1	—
Abscess in rectal sheath	—	1
Septic rash	—	1
Shock (death)	—	1
Pulmonary embolus (one death)	—	2 (one died)

Of the complications associated with the total operation, two are peculiar to the operation, and one is a risk of any abdominal section.

The case of gastric dilatation responded to gastric lavage; and the secondary hæmorrhage from the vaginal vault did not recur after securing the vessel with a suture. In one case a small abscess developed in the vault of the vagina, but apart from delaying the patient's discharge from the nursing-home, there was no other serious consequence. Of the complications associated with the subtotal operation, the abscess in the rectal sheath followed a hæmatoma, probably due to piercing a vessel with the "through and through" sutures. The patient who developed a generalized septic rash caused great anxiety. She had multiple fibroids and an unexplained temperature three weeks before operation. Operation was undertaken after this had subsided, and four days later she developed a rash on her buttocks, following enemata, which spread all over her body and was associated with a temperature of 103°F. and a pulse of 140. There was no evidence of peritonitis, and the abdominal wound was quite normal. Following the administration of anti-scarlatinal serum, the temperature gradually fell and there was general desquamation. There were two cases of pulmonary embolus, one of which died, and the case of shock which also died.

There were no cases of urinary fistula in the series. Two of the cases required blood-transfusion before operation.

From my own experience the mortality for an uncomplicated hysterectomy should be about one per cent. The two deaths in this series were in cases complicated by adhesions and additional tumours, which added to the operative difficulty or even overshadowed the actual hysterectomy. They were also difficult to anæsthetize.

AGE OF PATIENTS.

The average age for the whole series was 45½ years. The average age for patients operated upon in hospital was somewhat higher than that of the patients operated upon in private.

In a hysterectomy, either total or subtotal, one question always arises, Should an ovary or both ovaries be conserved? The problem in a large number of cases is settled for the operator on opening the abdomen, because both ovaries may be the seat of extensive cystic disease, or may be involved by endometriomatous tumours or by inflammatory adhesions. In such cases it is much wiser to remove both ovaries, especially in a patient at, or past, the menopause. One great advantage of removing the ovaries is that it makes the operation easier and the peritonizing of the pelvic floor more complete. There is also the advantage that one removes an organ in which tumours can develop in later life. All gynæcologists have had the unpleasant experience of having to remove ovaries which have been conserved, and it can be a very difficult operation, especially when it is the left ovary.

The ovary becomes matted over with adhesions, and the sigmoid flexure has a most unfortunate habit of wrapping itself round the organ. The difficulty experienced in removing conserved ovaries has perhaps something to do with the large number of cases in which the ovaries have been removed at the primary operation in the series.

In women who are in the early thirties, it is probably better to conserve one ovary, and for preference the right.

The supposed advantage (I say "supposed," in view of what I have to say later) of conserving both ovaries is that the menopausal symptoms associated with castration are not manifest immediately or are considerably alleviated. It has been observed by many surgeons that the menopause appears prematurely after hysterectomy, whether the ovaries have been conserved or not.

Murphy and Sessums,[7] investigating the surgical menopause in cases operated upon before the age of 36, with conservation of one or both ovaries, found that 43.9 per cent. experienced hot flushes before the age of 40. They state that this percentage was approximately eight times that occurring in a group of women of corresponding ages not operated upon. In another paper (8) they state that the flushes were more common, more severe, and appeared sooner after bilateral than after unilateral oophorectomy, but they think that the surgical menopause was shorter after associated bilateral oophorectomy than after hysterectomy with ovarian conservation.

Polak,[9] in a paper which deals with seventy-three cases which had to be re-operated upon for pathological conditions of conserved ovaries within five years of the primary operation, discusses the end-results of the conserved ovary. He says: "A conserved ovary, if unhealthy, will leave the patient in a worse state mentally, nervously, and physically than if total extirpation had been done." He thinks that when a patient has reached or passed the age at which the menopause should occur, a total ablation gives the best results. Polak agrees that theoretically "the loss of the ovaries means the loss of sex influence to the individual, with all the grave

disturbances in general metabolism which this loss signifies, and the earlier in life the greater the calamity, but practically the patient's well-being may be seriously impaired by routine conservation."

Of the six patients in my series, where one ovary was conserved, one patient operated upon four years ago was 41 at the time (but did not look it). This patient developed menopausal symptoms one year later which lasted for eighteen months, were mild in character, and since then she has been very well. Two patients were operated upon two years ago, and have not had any menopausal symptoms. Of the other three, two were operated upon eighteen months ago, and one is still under a year. None of these has had any menopausal symptoms. These six patients were the youngest in the series, the average age being thirty-three, and the ovaries conserved were not, to the naked eye, pathological. So far none of these patients has developed any pathological symptoms associated with the conserved ovary, and their menopausal symptoms have been absent or mild in degree. In the remaining 116 cases both ovaries were removed at the time of operation, but most of the patients were either at or past the menopause or had pathological ovaries.

TABLE VI—"FOLLOW-UP."
(110 Patients.)

Untraceable	4
Died since operation	5
Replied to questionnaire or interviewed	101

In following up these cases, four objects were in view: (*a*) To ascertain the character and where possible the duration of the surgical menopause, (*b*) the incapacity following the operation, (*c*) whether the cervical stump in cases of subtotal hysterectomy has caused any trouble, and (*d*) the condition of patients operated upon for carcinoma of the body of the uterus.

Of the 110 cases followed up, four were untraceable, leaving 101 who were either seen personally, communicated with by letter or through the patient's own doctor, and five who were found to be dead.

TABLE VII.

Operation for	*Cause of Death*	*Age of Patient at Death*	*Years after Operation*
Fibroid	"Hæmorrhagic enteritis"	44	4
"Fibrosis uteri"	Cardiac and renal disease	53	5
Sarcoma	Cerebral hæmorrhage	68	2½
"Fibrosis uteri"	Coronary thrombosis	56	4
Cancer of uterus	Recurrence	60(?)	1

MENOPAUSAL SYMPTOMS.

This investigation was started with the preconcieved idea that the removal of both ovaries, even in a patient at or about the menopause, led to menopausal symptoms more severe than those of the natural menopause.

Ninety-five of the patients "followed up" had both ovaries removed, and these

are divided into three classes. The menopausal symptom inquired for was "flushing," which is the commonest and most distressing symptom complained of. According to this symptom the cases have been divided into those who have had "severe," "mild," or no flushes.

A case was regarded as "severe" who had flushes of frequent occurrence and lasting over one year; a "mild" case was one where the flushes lasted only for a few months, and were infrequent. The following table gives the figure under these headings :—

TABLE VIII—MENOPAUSAL SYMPTOMS.

(95 cases with removal of both ovaries.)

Severe	*Mild*	*Absent*
33	28	34

It will be seen that sixty-four per cent. of cases had menopausal symptoms, but that in only about thirty-four per cent. were these regarded as being severe. Just under thirty-six per cent of the cases stated that they had no symptoms, i.e., flushes. The highest proportion of cases exhibiting no flushes occurred among a series of private cases. Among the hospital cases the type of patient in whom one would have expected to find most symptoms, i.e., nurses, had none. One patient operated upon at the age of 65 (menopause fifteen years previously) developed flushes, which are still present at the end of two and a half years. Another patient who had severe flushes and headaches before her operation is now completely relieved.

Martindale,[10] in a paper on the artificial menopause, found that 41.9 per cent. of cases where one or both ovaries were conserved at operation had no flushes, but her series where both ovaries were removed was too small to form a comparison.

Murphy and Sessums[7] found that hysterectomy before the age of 40, even when the ovaries were conserved, hastened the menopause. They showed that 53.2 per cent. of cases with conserved ovaries had menopausal symptoms before 40, and that the average time of onset after the operation was 15.7 months.

These figures given above made one rather curious to know what exactly were the figures for the normal menopause under the same headings. For this purpose, "An Investigation of the Menopause in One Thousand Women,"[11] conducted by the Council of the Medical Women's Federation, may be quoted. This investigation showed that the most frequent symptom associated with the menopause was flushing. It also showed that single women are more likely to pass through the menopause easily than married women.

The average number of women, married and single, who pass through the normal menopause without symptoms is 15.8 per cent., but the average for single women is 20.4 per cent. It is also pointed out that the duration of the flushing period is very variable; in the majority it lasted about two years, but some women in the seventies and eighties have never been free from flushing since the menopause.

From these figures and literature one might conclude that flushing, which is the most troublesome feature of the menopause, is less in the artificial than in the natural menopause. As against this conclusion, one has to remember that the

average age for this series was 45½ years, and that therefore some of the patients had already passed the menopause.

One might also find these figures some justification for removal of both ovaries at the time of operation, because even conservation of the ovaries may only delay the onset of symptoms for a period of fifteen months, according to the authorities quoted. The patient therefore has a menopause associated with the removal of the uterus, only to have a second menopause associated with the atrophy of the conserved ovaries, possibly in a relatively short time.

Of the patients operated upon in the past year, it has been found that those who have developed flushes did so within the first month after operation. It is too early to say definitely, but it has been my impression that those patients who have developed moderately severe flushes soon after operation are having a sudden short menopause. Many of these patients have said that at the end of five to six months their flushes were much more infrequent and less severe, and in some cases had disappeared.

INCAPACITY AS A RESULT OF OPERATION.

The incapacity resulting from the operation was estimated by the length of time before a patient was able to resume her usual duties. Taking the average for the 101 patients, this was just over five months. The shortest period was one month after operation (two nurses), and the longest was eighteen months.

This period of five months of incapacity does not, to my mind, really represent the amount of disturbance that occurs as the result of operation in those patients who develop severe menopausal symptoms. In these cases one feels that it is probably ten to twelve months before they really begin to feel quite well again.

TABLE IX—HEALTH FOLLOWING OPERATION.

Good	*Fair*	*Bad*
85	15	1

When inquiring about the general health of these 101 patients since operation, it was found that eighty-five were in excellent health, and it was a very usual thing to hear a patient say that she had not felt so well for years.

Fifteen patients are in "fair health," this being accounted for in the following ways :—

Seven patients can give no reason for not feeling quite well. Some of them have been operated upon under a year, and their ages vary from 44 to 57.

Two patients had previous operations some months before the hysterectomy, for inflammatory conditions, and would naturally have a prolonged convalescence after the second operation.

Two have developed ventral herniæ.

One patient has had two severe attacks of influenza since her operation fifteen months ago, and blames this for not feeling quite well.

One patient was very anæmic and emaciated, and before operation required a blood-transfusion.

One patient was operated upon six years ago for carcinoma of the uterine body, and is now seventy-one years of age. She feels in excellent health, but has got a recurrence in the vagina, which has responded to radium treatment.

One patient who had hyperpiesia before operation is still complaining of headaches.

The patient who complains of bad health was 69 when operated upon for a rapidly growing fibroid. The pathological report showed a fibroid with a low degree of malignancy (sarcoma?), but six months after operation she has a tumour in the lung, although the abdomen is free from metastases.

CERVICAL STUMP.

In forty-six cases of subtotal hysterectomy there were five patients who had some symptoms as the result of leaving the cervix. This was just over ten per cent. of the cases. All the cases complained of slight discharge or vulval irritation as the result of this. So far none of the cases have shown any signs of developing carcinoma of the cervix.

In my series, leaving the cervical stump does not seem to have given rise to any serious symptom, and in most cases the patients might have not referred to any discharge unless asked. There is no doubt, however, that there are serious potentialities associated with the subtotal operation.

CANCER OF THE UTERINE BODY.

There were thirteen cases of cancer of the uterine body and three cases of sarcoma.

	CANCER.—13.	
Died - - -	2	(One untraceable, regarded as dead.)
Alive - - -	11	
Over five years - -	2	(One very well; one with recurrence in vagina, aged 71.)
Over four years - -	2	(Very well.)
Over three years - -	3	(Very well.)
Two years and under	4	(Very well.)
	SARCOMA.—3.	
Dead - - -	1	($2\frac{1}{2}$ years after operation at 68.)
Alive - - -	2	(One with metastasis in lung.)

The two cases of carcinoma alive over five years after operation were both very advanced, but are both very well, although one has a recurrence in the vagina which has responded to radium, and illustrates the importance of keeping in touch with cancer cases after operation, and treating any recurrence immediately. One of the cases operated upon two years ago had a perforation at the fundus of the uterus, due to growth, to which small intestine was adherent; and one was very doubtful about the question of removing the uterus at all. She has never been so well, and last summer was assisting at the harvest!

One case died of cerebral hæmorrhage at 68, two and a half years after operation. Another is very well, one and a half years later, and the third is the case referred to with a metastasis in the lung.

In reading this paper I do not wish the members of this Society to think that I am an opponent of conservative surgery, but I feel on very safe ground in advocating total in preference to subtotal hysterectomy, unless in exceptional circumstances. As Spencer[3] says: "The subtotal hysterectomy is a nineteenth century operation. May there disappear that oppobrium to gynæcology, namely, cancer of the cervix left behind by the subtotal operation."

In suggesting the removal of both ovaries at the time of the hysterectomy, one does not feel on such safe ground, but I still think that it is the best thing to do in women at or past the menopause.

I would also make a plea for keeping in touch with all cases of cancer of the body of the uterus as well as cancer of the cervix. The case of cancer of the cervix is closely followed up, but the case of cancer of the body is liable to be neglected. In view of recent experience, I think that these cases should have more post-operative X-ray and radium than they have been given in the past.

In conclusion, I should like to thank all the doctors who have assisted me in inquiring about these patients, and Professor Lowry for facilities given me for operating in the Royal Victoria Hospital during the years I was on the auxiliary staff, and for permission to use these cases in this paper.

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